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Agricultural Transportation Challenges for the 21st Century

The Future Adequacy of Rural Roads

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Issue

Because of changing demands placed upon rural roads by U.S. agricultural and rural industry and the deteriorating nature of much of the rural road and bridge infrastructure in many rural areas, a long-term agricultural transportation issue is the ability of State and local governments to finance needed improvements in the rural road system.

Background

Since the 1980's, not only has larger, heavier agricultural traffic replaced light trucks and other vehicles that traditionally transported agricultural produce to market, but also the distance hauled has increased. Therefore, rural roads and bridges have had greater demands placed upon them. These changes in traffic are typified by increasing numbers of semi-trailers loaded in the field at harvest; the increased proportion of agricultural output hauled to nearby agricultural processing plants; and the increasing amount of grain hauled to unit-train-shipping terminal elevators or river outlets rather than to traditional country elevators. Abandonment of rail lines in many rural areas has also resulted in the increased use of semi-trailer transportation to grain markets. Finally, due to the increased size of farms, many suppliers of agricultural inputs have shifted to larger trucks and direct delivery to farming operations.

Although 28 percent of Federal-aid highway system mileage is rated as being in less than fair condition, the condition of highway systems in many key agricultural States is somewhat worse than that of the nation as a whole. In many important grain-producing States (including Colorado, Idaho, Kansas, Minnesota, Montana, Nebraska, and South Dakota), more than 40 percent of the major highway system is rated as being in less than fair condition.¹ Thus, these agricultural States critically need more funds to invest in their major highway systems.

In addition, many rural collector and local roads need improvements. These roads, which comprise a large portion of the rural road network, are as important to agricultural firms and rural communities as the rural Federal-aid highway system. Although most of the infrastructure

¹ Based on 866,028 reported miles of a total of 950,215 Federal-aid highway miles from a road information analysis of the Federal Highway Administration.

required to support current economic activity in rural areas is present, many of the current roadways are beyond their engineered design life. In fact, much of the rural road network in the United States was constructed during an era of slower travel and lighter vehicles. Current traffic, which is heavier and wider, has accelerated the rate of deterioration and made these types of roads less serviceable.

A 1994 survey on the condition of local roads indicated that the condition of over 50 percent of the county road mileage is rated as less than adequate or worse. This indicates that county roads will need considerable attention in the near future. This figure is probably even higher in more rural counties, even though the traffic volumes are probably less.

Despite additional truck traffic, there is some evidence that the condition of the local road network serving rural areas has improved. For instance, the proportion of road mileage with higher all-weather surface types has increased. In addition, among towns, the overall condition of the network seems to have improved. Finally, for the sample of counties and towns participating in both the 1987 and 1994 surveys, the percentage of road mileage rated as less than adequate or worse has declined.

However, the increased use of semi-trailers has resulted in greater damage to many local and collector roads as well as in increased road maintenance costs for local governmental units. The additional costs due to increased truck traffic vary widely according to differences in regional climates, subsoil conditions, the type and weight of the traffic, and the type and thickness of the pavement. Various studies have estimated damages done by additional truck traffic. One of these studies estimated these costs to average \$.075 per ton-mile on county roads and \$.050 per ton-mile on State roads.

Generally, the smaller the population of a county or town, the higher the percentage of lower level surface type roads. The correlation between surface type and population is a direct reflection of the travel demands placed upon the road network by local users. These lower level surface type roads are damaged most by additional semi-trailer traffic.

Much of the revenue available to local governments comes from State aid and local property taxes. Because many rural areas have had declines in population and property valuation, many local governmental units have come under increased financial pressure to maintain their existing roads at these higher levels of traffic.

Once initial investments are made in an all-weather road surface, the road must be maintained in usable condition. During periods of local fiscal stress, the financing of road upgrades and regular maintenance schedules on this mileage can be difficult. Because the local road budget is often the single largest item in county or town budgets, short-term fiscal pressures may reduce or delay regular maintenance of roadways. Especially with higher level surface type roads, these traditional road maintenance strategies can lead to much more costly repairs in the long term.

Implications

Rural roads are vital to the movement of agricultural production from the farm to the first elevator or marketplace. In addition, these roads are used extensively in the secondary movement of grain from country elevators to terminal elevators or domestic processing plants.

Increased truck traffic on rural roads increases the costs of maintaining these roads, requiring local governments to either increase taxes or decrease the level of road maintenance, either choice resulting in increased transportation costs to those using the roads. Decreased levels of road maintenance increase transportation costs due to increased travel times, accident rates, vehicle maintenance costs, and fuel costs. Since agriculture is a competitive industry, these increased transportation costs will come directly from farmer income.

The lower traffic densities on rural roads and the heavy reliance of local governments upon State and Federal funding suggests that rural areas will have to compete vigorously with urban areas for the funding necessary to maintain their roads. Urban roads will tend to receive a higher proportion of road funding due to larger traffic volumes and greater numbers of accidents. In addition, the increasing proportion of urban population results in increased urban political power. Thus, the condition of rural roads is certain to decline over time if road funding is based only on the volume of traffic, rather than also considering such factors as the condition of the roads, underlying soil type, and the prevailing climate.

Information Sources

Bitzan, John, Joel Honeyman, Denver Tolliver, and Kenneth Casavant, *The Impact of Rail Restructuring on Rural and Agricultural America: Case Studies of Rail Abandonment*, Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota, 1996.

Casavant, Kenneth L. and J. C. Lenzi, *Procedure for Predicting and Estimating the Impact of Rail Line Abandonments on Washington Roads*, Washington State Department of Transportation, Olympia, Washington, 1989.

Deller, Steven C. and Norman Walzer. *Rural Roads and Bridges: A Comprehensive Analysis*, U.S. Department of Agriculture, Agricultural Marketing Service, Washington, D.C. 1997.

Tolliver, Denver, *Highway Impact Assessment*, Westport, Connecticut, Quorum Books, 1994.

U.S. Department of Transportation, Federal Highway Administration, Federal Highway Statistics 1996.